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THE FUTURE OF THE STATE ACADEMY OF SCIENCE[1]

IN SCIENCE of December 5, 1919, Mr. D. D. Whitney presents certain data and conclusions on State Academies of Science. Omitting mention of a number of large academies centering in cities his figures show that membership varies from 25 to 350; that annual dues run from 50 cents to $10; that annual receipts from state or private sources vary from none to $1,500, 9 out of the 18 enjoying such receipts; that 4 out of 18 pay their officers salaries, from $75 to $1,000; and that the annual publications by 12 out of the 18 academies contain 50 to 600 pages.

In these academies Mr. Whitney finds great variation as to interest and vitality, comments from the officers being "dead" in three cases, "apathetic" in others, and "very lively" in a few. Assigning grades to indicate the various degrees of health and vitality, we may say that of the eighteen academies considered, two would be graded A or "superior"; one B, or "good"; eight C, "passing"; four D, "poor but passing"; and three E, "failure." This result seems to follow the probability curve fairly well, and should perhaps cause us to look upon the situation with some complaisance. It might be unreasonable to expect all of the group to come up to the highest standard of excellence.

Our own academy is reported as having 96 members, no annual state appropriation, no salaries for officers, no annual publication, and as manifesting an interest "fairly lively." This ranks us as of about C grade, passing but without distinction. Our growth, however from 46 charter members in 1914 to 110 members in 1920, indicates a persistent vitality, and the classification of our membership, 25 per cent. of our resident members being un-

[1] President's address before the Kentucky Academy of Science, Lexington, May 8, 1920.

connected with educational institutions, shows that we are to a small extent at least "unifying the scientific interests of the State."

Mr. Whitney takes a somewhat somber view of the future of the state academies. He points out the fact that only a small percentage of the scientific men and women of the states are affiliated with the academies, explaining the fact by the existence of larger societies for specialists which appeal more strongly than the local academies with this lack of differentiation. However, he mentions two advantages of the state academy; the opportunities for social intercourse and good fellowship which tend to encourage scientific effort in smaller colleges and normal schools; and the provisions for the publication of articles that would not be accepted by the larger and more important periodicals. To these we should add the practise of bringing to the annual meeting some outstanding scientist who otherwise might not come before our membership.

This article suggested to the writer that it might be well to ask the secretaries of these academies certain questions with a view to determining if possible a little more definitely whether there is a field and a future for the state academy, and in particular for the Kentucky Academy. Accordingly a series of questions was proposed, the first of which was whether, in view of the large number of national and regional scientific societies there is any need for a state academy. Mentioning the replies from state academies only the vote stood: Yes, 9; No, 2. These two negative votes were, curiously, one from a very active academy centering in a large city, and one from a state academy reported by Mr. Whitney as showing lively interest at the annual meeting but apathetic the remainder of the year. We may say however that most of those reporting, whether lively or moribund, wish still to live and claim for themselves a *raison d'etre*.

The second question asked was "What are your reasons?" First let us notice the reasons of those who vote against the state academy. We are told that the academies are not needed because a state does not seem to be a convenient unit for scientific organization; because the interest in the academies is very small; because the publications are mediocre, no one being willing to publish their good articles in the *Proceedings* for fear that they will never be seen; because the social value is the only real value and that is not sufficient justification for the work entailed; and because the professional men and every one else have their own societies in which they are much more interested.

But the affirmative argues that the academies have a field and are needed, because their meetings are so near home that scientists of the state can get together; because a large number of the members are young people who are not yet, and in many cases never will be, ripe for membership in the national societies, but who can be greatly stimulated by the academy activities; because the society brings together scientists of varied interests, there being too much subdivision and segregation in the scientific field at present; because they bring men not connected with educational institutions in touch with scientific matters; because they give opportunity for papers of local interest which would not find place on the programs of national societies; because they foster state pride and interest in state welfare; because they bring to bear a certain amount of influence for the betterment of the state; because, except in the field of chemistry, they are about the only local scientific societies that emphasize research rather than education; because they exercise a tonic effect in the life of the state and foster a proper appreciation of the value of science; and because they supply a needed element of organization in the scientific field which the national societies do not afford.

With the feeling that, valuable as is the annual meeting of the academy, there should be some larger service possible in the interests of science and the state, a third question was asked for information regarding other activities. Of the eleven academies being quoted, four did nothing beyond the annual meeting, ex-

cepting in some instances, the publication of the annual proceedings. Other answers were that the secretary sends out letters to find out what is going on in the way of science advancement; that an annual expenditure of $250 is made in grants for the encouragement of research on the part of members; that a library and exchanges are kept up; that various sections hold meetings throughout the year; that a second meeting of the academy is held; that an out-door "excursion meeting" is held, usually for two days, when members ride, tramp, camp, do field-work and get better acquainted; and that a number of committees are working on various problems of value to the state. This last comes from Illinois, where the academy has a committee on the Ecological Survey of the State, organized now for ten years; a Committee on Science Education; a Committee on Legislation as affecting Scientific Interests; and a Committee on Conservation of Wild Life in the State.

Omitting other questions asked of the academies the last should be mentioned, namely, "What new forms of scientific service might the Academy undertake?" Here we run against the very general handicap of lack of funds. Many things might be done if only the necessary money were available. The need is felt of more money for publication, more money for research funds, more money for surveys. But a number of other suggestions are made. The academy might become more influential as an adviser in connection with legislation affecting the natural resources of the state. The work of science should be more closely correlated with the industries of the state. More effort should be spent on the problems of development of the natural resources of the state on a firm scientific basis. The members should be stimulated to study and report on many subjects of state or local interest. Local chapters should be formed. State surveys in botany and zoology and geology should be organized and allotted to various members. High-school teachers should be brought in to the academy for the sake of better science in the high schools. Science clubs should be organized in the high schools, these clubs to be affiliated with the State Academy.

These ideas should prove exceedingly suggestive to us in Kentucky. No state in the union offers a richer opportunity for the efforts of an energetic and progressive Academy of Science. It would be a reflection upon your intelligence to argue the point that the war just closed has proved the value and the need of science. Scientific achievements threatened civilization with destruction, and science was an essential in the salvation of the world from barbarism. No civilized nation will henceforth be so criminal as to neglect the deliberate, systematic, organized effort to develop science in the interests of national defense and domestic welfare. This essential importance of science was recognized by scientists long before the war, if it was not by the general public. But scientists themselves apparently had not realized the necessity for organization and cooperation in scientific effort as well as in government and in industry. This perhaps is the outstanding fact before our minds to-day. We saw the forces of science hurriedly and effectively classified and grouped and directed under the leadership of the National Research Council during the war. In peace we are now seeing the same idea carried out in the organization of International Associations, in the present-day program of the National Research Council, which contemplates the permanent coordination of the scientific work of the nation, and in the enlarged program of the American Association for the Advancement of Science. Both the Council and the Association propose to reach down and touch local scientific interests through the state academies.

In this fact we find an immediate and conclusive reason for the continuance of our State Academy. No organization can be complete without its subordinate units, nor can the scientific interests of the nation be completely fostered and directed without state and local groups. In the army must be brigades and regiments and battalions and companies and squads. The state academy

furnishes the necessary subdivision for the effective marshalling of the nation's scientists.

This being agreed to, it follows logically that the state academy should proceed to organize local chapters for the completion of the system. The greatest need now is not more national societies but a more thoroughgoing organization of state and local scientific forces. We have already seen that in Illinois an effort is being made to stimulate the formation of science clubs in the high schools and to interest high school teachers in the work of the academy. Our Academy has a goodly percentage of its members among scientists not connected with educational institutions. What is needed is that this membership be greatly extended and organized into chapters so that every large industry and even the smaller establishments will be brought into touch with the academy and through it coordinated with the national organizations. The academy will thus include in its fold both those who love science for its own sake and for the extension of knowledge and also those who are using science for the furtherance of industry and the material advancement of man.

But the academy finds justification apart from its usefulness as a subdivision in the great national organization in that it can serve its own state in many distinct directions. Many lines of possible service have already been suggested in the summaries of the questionnaires, but it will be worth our while to think a little farther concerning some of them. Isolation is one of the most serious handicaps to research, although it can doubtless be shown by examples how certain great constructive geniuses have lived their lives in seclusion and by the sheer power of intellect brought to light important additions to human knowledge. Many have found the needed contact in correspondence and publications. But for the average scientist whose number is legion and whose aggregate contribution to progress is large, the stimulus of human association, and the spur of close contact with kindred minds are indispensable. We can not depend entirely upon the large universities nor upon the large industrial establishments for our scientific life. There will always be able men in the smaller colleges and schools and in the smaller establishments who must have opportunity for contact and mutual inspiration and suggestion to enable them to produce their maximum effort and stand as missionaries in the cause at home. The academy must supply to all scientific workers in the state this desirable contact and mutual helpfulness.

Selfishness and secretiveness and suspicion in research, individualism must now give way to coperation for the sake of the advancement of knowledge and of social and industrial progress in the state. Scientists have much to learn in this respect from statesmen and business men. Men do not greatly increase their wealth by hoarding; they do not make most in small private businesses; they do not win wars by "sniping," they do not destroy threatening social iniquities by individual blamelessness. Efficient machinery directs and multiplies power, increases speed.

The academy should come to be a source from which any man in the state who needs help along scientific lines may draw what he needs. If for instance a worker in some small or large industry of the state feels the need of consultation or advice he should come to look upon the academy as the proper organization to which to apply. The academy through its officers or special committees should be in a position to answer his questions or to direct him to those of its members best fitted to render aid. An instance to the point is that of a research chemist in a large drug manufactory who was enabled to complete a three year research which had failed of reaching a definite result, by means of a hint from a university worker. In our own state many such cases of helpfulness will arise if we can bring our academy to the point where it will be regarded as the natural place to which to come for information as to facts and men.

The organizers of the academy six years ago had in mind the possible usefulness of the academy as an adviser in legislative matters affecting scientific interests when pro-

vision was made in the constitution for a standing legislative committee. This committee was appointed for a number of years, but gradually sank into "innocuous desuetude" through lack of effort or of opportunity for rendering service. The question now arises whether the present, when all things are being made over, when all institutions and societies are feeling the new impulses furnished by the war, is not the proper time for a rejuvenation of this committee. It is safe to say that the academy in the past has not at all impressed itself upon the attention of our legislatures nor our citizenship and that outstanding usefulness will come to such a committee only after years of steady growth in the size and activity of the academy. The time to begin however is now, and the way to gather to itself influence and authority as an expert adviser is to begin first with a thorough study of local scientific problems and to put before the public in speech and print definite facts and recommendations. No other opportunity for extension of academy activity and service seems more fertile in possible good than this. Not even the State University, which stands before the public in a peculiar sense as the guardian of state scientific and industrial interests, can appeal to all elements in the state as a disinterested and representative source of expert advice as can the Kentucky Academy. There is distinct need for such a force in the life of the state and the academy must not prove false to her mission nor neglect her manifest opportunity by failure to assume the responsibility of leadership.

Many problems face us in Kentucky that will need the keen interest and intelligent cooperation of the especially qualified membership of the academy. In this last legislature there arose a rather minor question the handing of which well illustrates how valuable can be the man who knows. A bill was proposed which placed a bounty on hawks and owls, the idea being that without exception all such birds are pests, killing quail and chickens with ruthlessness and dispatch. The bad science back of such a bill was discussed in one of our societies at the university and word was sent to the committee considering the bill that the bill threatened injustice to a large class of desirable bird citizens. As a consequence two members of the Legislature paid a visit to one of our professors for the purpose of getting information, and were quickly convinced that only the Cooper's hawk is depraved while all the others are useful in that they kill rats and other undesirables. This incident calls attention both to the value of expert testimony and to the prevailing lack of scientfic treatment of problems affecting many people and widespread social and industrial interests. In our hap-hazard, hasty, self-confident, irresponsible law-making, certainly some organization should stand out before the public as a source of sane reliable and unbiased scientific information.

There is great need for scientific direction and propaganda for the preservation of bird life, for the proper appreciation of their economic importance. Only last Tuesday one of our professors stated before the Audubon Society that the bird population of the state and nation had been reduced approximately 50 per cent. in the last 15 years; and that the causes were, next to cats, the destruction of our woods and forests. And yet, he said, birds are the greatest weapon of the farmers against crop-ravaging insects.

There is pressing need that wise research and public education be devoted to the problems of forestry. Many problems of forestry must be solved if the forests are to continue adequate and the supply of lumber be on hand for succeeding generations of men. The mineral resources of the state present problems that must be the concern of all properly qualified scientists of the state. The preservation and development of our water-power resources demand intelligent survey-work, persistent public education and authoritative advice to our legislatures. The growing of tobacco has reached such proportions in the state as to affect the well-being of large numbers of citizens. It is not the part of

wisdom to banish all study of the growing and marketing of tobacco because of a dislike for the weed and disapproval of its use; but rather for all so qualified to unite in a program of research and education that will conduce to the improvement of the human elements involved. The preservation and promotion of human health is a matter of "vital" concern to every citizen, and there is abundant need and opportunity for a representative state scientific society to exert its strength toward the conservation of vital resources.

It is not being urged that the academy should attempt to take over the work of the experiment station or of the private laboratory. That of course would be ridiculous. Rather, the academy should be a medium through which men in various parts of the state and in various educational and industrial plants may be associated in the furtherance of needed scientific endeavor. Such a medium will bring all men in touch with problems of research in which they may be fitted by training and location to take a part in problems too large and complex and requiring too many phases of scientific treatment for one man to handle. We may well imagine for instance that officials of the National Research Council, wishing to find qualified men in certain parts of Kentucky to carry on locally a certain part of some large piece of research will come to the Kentucky Academy for information and advice as to men. Such an organization should be in a position through its officers and committees to speak with authority and conviction upon all matters of scientific importance in the state, bringing to bear upon public opinion the weight of disinterested scientific unity. Certainly such an active and influential academy would stimuate research in Kentucky and the whole South, render valuable aid in assignment of problems and the placing of men, and guide public opinion into the proper understanding of local scientific matters.

Our study has led us to feel a firmer faith in the mission of our Kentucky Academy. From her modest past she may yet arise to grand proportions of influence and usefulness. To that end let us adopt a program commensurate with the spirit of the times.

First, let us cooperate heartily with the national bodies seeking to organize the scientific forces of the country.

Second, let us actively seek to extend our membership to every educational and industrial plant in the state, and to every scientist, and exert a scientific leadership throughout the state.

Third, let us promote the organization of science clubs in our secondary schools and of research clubs in various centers.

Fourth, let us bring our influence to bear upon the problem of better science teaching in the high schools.

Fifth, let us appeal to the next Legislature for liberal publication funds, and to the public for research funds to be used in support of local scientists.

Sixth, let us through appropriate committees undertake the study of definite scientific problems of importance to the state, and promote the scientific surveys very much needed.

Seventh, fortified by our especial studies, let us plan to recommend to the next Legislature legislation needed for the scientific interests of the state.

Eighth, let us with faith in our mission and with devotion to the cause make the Kentucky Academy of Science the most influential for good, the livest thing, in Kentucky.

The needs of the day call for such an expansion and such an increase in aggressive effort. We can not live in this good new day and be content with the past achievement. General Foch has said that no battle was ever won by an army on the defensive. To win we must be aggressive.

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